

REMARKS

Claims 1-14, 16 and 18-25 are pending in the present application.

By the amendment submitted herewith, claims 4 and 7 have been amended to depend from claim 2. No new matter has been added.

REJECTIONS UNDER 35 U.S.C. § 103

In Office Action item 3, the PTO rejects claims 1-4, 6, 7, 9, 11-15 and 17-24 under 35 U.S.C. § 103(a) as being unpatentable over Teicher et al. (U.S. Patent No. 2004/0002636 A1) in view of Roenker (U.S. Patent No. 5,801,810) in view of Jiang et al. (The Spatial Gradient of Visual Masking by Object Substitution, 2001).

The PTO asserts that Teicher et al. teach steps (a), (c)(ii) and (d) of instant claims 1, 18, 20 and 22, and the recited steps of claims 4, 6, 7, 9, 13 and 14. The PTO also asserts that Roenker teaches the steps (b) and (c)(i) not found in Teicher et al. and also the recited steps of claims 2, 3, 11, 12, 19 and 21. The PTO concedes, however, that Teicher et al. and Roenker “fail to disclose the mask is comprised of an image having at least one filled circle” as recited in parts (b) of independent claims 1, 18, 20 and 22 and in dependent claim 16.

The PTO further alleges that Jiang et al. remedy the deficiencies of Teicher et al. and Roenker. Specifically, the Examiner asserts that Jiang et al. disclose “a means for applying a mask to a visual stimulus and further disclose the mask is comprised of an image having at least one filled circle”, citing the introduction, third and fourth paragraphs and Section 2.1 “Method.” The Examiner asserts that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the combination of Teicher et al. and Roenker to include the use of a mask comprised of at least one filled circle, as per the teachings of Jiang et al, since a filled circle would not have the same contour as the test stimulus and thus prevent a contour interaction between the test stimulus and the mask to provide more accurate results from the test subject.

Applicants respectfully traverse these grounds for rejection. The presently claimed embodiments are directed in pertinent part to a method comprising the recited steps,

including steps in which a mask comprising “an image having at least one filled circle” is used to mask the stimulus by “placing a mask over or in place of the entire visual test stimulus (emphasis added).”

Applicants submit that the prior art fails to teach or in any way suggest the presently claimed methods and system in which the mask used in the step of masking the test stimulus comprises an image having at least one filled circle.

Additionally, the PTO fails to provide evidence or reasoning as to why, given Teicher et al. and Roenker and Jiang et al, the skilled person would have arrived at the presently claimed invention with the requisite reasonable expectation of success.

Particularly, Jiang et al. disclose methods for testing the spatial properties of substitution masking, *i.e.*, specificity to the target location and asymmetry to the central and peripheral sides of the target, for use in visual perception assessments. According to Jiang et al., in substitution masking, observers are presented with a search display containing geometric squares, one of which is the target, designated by a cue in the form of four dots that form the corners of an imaginary square centered on the target. (See paragraph bridging pages 1-2 of Jiang et al). The search items and the four dot cue are presented simultaneously for a short period, then the search array is made to disappear, leaving the four dot cue behind for a little longer (*e.g.*, 160ms).

The lingering four dot cue functions as a mask disrupting the target’s identity by appearing as if the target was replaced by the surface of the imaginary square (emphasis added) demonstrating the phenomenon of masking by object substitution.

The same approach was adopted in the methodology of Jiang et al. as illustrated in Figure 1, where a four dot mask is “centered on the target or any of the flankers” in a linear array of random letters. As can be seen from Figure 1 (excerpt shown below), the four small dots are actually squares.



As stated in Jiang et al. “*the four-dot mask used in Experiment 1 contained 36 pixels in total*” (p. 3126, left-hand column, last complete paragraph, emphasis added). Since pixels are square, each of the dots must have been a 3 x 3 matrix of pixels. It is further stated in Jiang et al. that each of these small squares subtends 0.15° x 0.15° and forms the inside corners of an imaginary square. As is clearly stated by Jiang et al, it is the “imaginary square which served as the mask”, not the four-dots/squares indicating its position (page 3124, Experiment 1).

Figure 1 does show three unfilled circles, but these are merely provided by Jiang et al. in that figure to illustrate to the reader where the target stimulus may appear in different trials (see description directly beneath Figure 1). Jiang et al. clearly state that the black circles illustrated in Figure 1 are “not actually presented.” Thus, it cannot reasonably be asserted that the disclosure of Jiang et al. teaches or suggests a mask comprising one or more filled circles.

Moreover, in Jiang et al., the substitution masking approach differs from the masking approach as recited in the instant application because in Jiang et al. the mask (being an imaginary square defined by the square markers in the corners of the imaginary square) is presented simultaneously with the target. In contrast, the claims of the instant application recite that “presentation” of the stimulus and “masking” of the stimulus by placing a mask over or in place of the entire visual test stimulus are separate steps in the claimed method. This is not the case in Jiang et al.

Further, Jiang et al. do not mask the “entire visual test stimulus (emphasis added).” Rather, only the target letter of Jiang et al. is masked by the imaginary square. The letters flanking the target and comprising the rest of the letter array are not masked at all. Jiang et al. explicitly comment that the mask “*did not spatially overlap with the target*” (p. 3122, emphasis added) and that they were “*interested in how it [substitution masking] is affected by the distance between the target and the mask*” (p. 3123, emphasis added). Thus, it cannot be said that Jiang et al. mask “the entire visual test stimulus.”

Further still, Jiang et al. do not place a mask “over or in place of the entire visual test stimulus” because the mask in Jiang et al. is an imaginary square which does not exist and consequently, cannot reasonably be considered to be placed over or in place of the entire visual test stimulus.

Additionally, assuming that the Examiner's interpretation of Jiang et al. is contrary to the explicit statement that the imaginary square serves as the mask and that in such an alternative interpretation the four dots are considered by the Examiner to comprise a mask, it is respectfully noted that (a) these dots of Jiang et al. are actually squares and not filled circles; (b) as discussed above, they are presented simultaneously with the letter array (test stimulus) and not in a separate step; and (c) they are not placed over or in place of the entire visual test stimulus. Rather, the entire test stimulus is still visible while the four dots are presented – there is no overlap or covering over of the test stimulus or any part of the test stimulus with any one or other of the four dots in Jiang et al.

Applicants are confused by the relevance of the PTO's assertion that, according to the teachings of Jiang et al, a filled circle would not have the same contour as the test stimulus and thus prevent a contour interaction between the test stimulus and the mask to provide more accurate results from the test subject. In fact, Jiang et al. appear to be stating the opposite, i.e., that feature overlap (i.e., contour interaction between the test stimulus and the mask) has no effect on the strength of substitution masking. This is evident in the following statements in Jiang et al.:

“...the contours of the four-dot mask do not resemble that of the target. There is, in fact, very little contour in the mask. This rules out explanations [for why substitution masking is occurring in Jiang] based on low-level contour interaction between the target and the mask (Alpren, 1953; Breitmeyer, 1984).” Jiang et al. p. 3122, column 1, paragraph 2 (emphasis added).

“We varied the type of the mask and measured the extent of masking. Using letters as the elements on the search display, we found that substitution masking was not affected by (1) the categorical similarity between the target and the mask (letter vs. reflected letter, symbol vs. random dots) or (2) the feature similarity between the mask and the target (mask composed of lines and line junctions vs. mask composed of random dots).” Jiang et al. p. 3122, column 2, paragraph 1 (emphasis added).

These disclosures by Jiang et al. appear if anything to teach away from the PTO's assertion.

In the instant application and for the reasons given above and previously made of record, it is submitted that the PTO fails to provide evidence or reasoning as to why the skilled

person would reasonably have been expected to combine the recited elements, particularly since the combination of cited prior art documents fails to teach each and every one of the cited elements either separately or together. *Inter alia*, the presently recited step of masking would not reasonably have been expected to contribute to the CPT test of Teicher et al., and as applicants have explained in previous submissions of record, this masking step further relates to unpredicted advantages that derive from the use of a mask comprising an image having at least one filled circle, a combination that is nowhere suggested in the prior art.

Further, with regard to the relevance of Roenker to steps (b) and (c)(i) of claims 1, 18, 20 and 22 and to the recited steps and features of claims 2, 3, 11, 12, 19 and 21, applicants have previously argued that it would not have been obvious, at the time the instant application was filed, to combine the teachings of Roenker into Teicher et al., because Roenker teaches a perception test and not a cognitive test. In paragraph 12 at page 12 of the current Action, the Examiner has referred to Merriam-Webster's Online dictionary to define perception as: "quick, acute, intuitive cognition", and relies on this definition to conclude that Roenker discloses a cognitive test and not a perception test. Applicants respectfully submit that one of ordinary skill in the art would not rely on a standard dictionary meaning to define complex psychological constructs and that it is unreasonable for the PTO to do so.

Within psychology, perception is considered to be the process by which inputs from the sensory systems are organized and recognized so that those inputs can be used by the cognitive processes. Consequently, "perception" and "cognition" are taught and researched as separate disciplines. In fact, one of the flagship journals in psychology, the "Journal of Experimental Psychology" is a family of journals that separates cognition and perception as distinct disciplines. This is evident in the individual journal titles within that family: "Journal of Experimental Psychology: Memory, Learning and Cognition"; and "Journal of Experimental Psychology: Human Perception and Performance."

In view of the foregoing, applicants respectfully submit that at the time of filing the instant application, a person having ordinary skill in the area of psychology would have understood that a test of perception is not *per se* a test of cognition. For example, a test of visual acuity (a perception test), which examines the accuracy of the information the brain receives

from the eyes, does not convey anything about the process or attributes of cognition (*i.e.*, memory, language, attention, thought, reasoning and decision-making); it only tells the reader whether the information gathered is accurately represented (*i.e.*, before cognitive processing begins). Thus, it is submitted that the skilled person would not take perception to mean cognition, or believe that a test for perception is the same thing as a test for cognition. It is therefore further submitted that it is unreasonable to conclude that the skilled person in the relevant art would have combined the teachings of Roenker and Teicher as alleged by the PTO.

For these and other reasons discussed herein, it is therefore submitted that the presently claimed subject matter is patentably nonobvious. Favorable reconsideration of the instant claims and withdrawal of the rejections under 35 U.S.C. § 103 are respectfully requested.

In item 4, the PTO rejects claim 5 under 35 U.S.C. § 103 as being unpatentable over Teicher et al, Roenker and Jiang et al as applied to claim 1 and further in view of Hongo et al. (U.S. Patent No. 5,345,944). The PTO concedes that the combination of Teicher et al., Roenker and Jiang et al. fails to explicitly disclose an error rate curve chart representing the error rate, but asserts that Hongo et al. remedy this deficiency, citing Figure 11 of Hongo et al. in support.

These rejections are traversed for reasons given herein and previously made of record, including Applicants' response submitted on June 19, 2009 (see, *e.g.*, from page 13 commencing at paragraph B.) reconsideration of which is respectfully requested. The PTO's detailed remarks in the current Action, responsive to applicants' June 19, 2009 submissions, are noted. However, applicants respectfully disagree for at least the following reasons. Specifically, the PTO asserts (Action at page 13, last paragraph continuing onto page 14) that one of ordinary skill would be able to deduce the percentage of errors from the percentage of correct answers since subtracting the percentage of correct responses from 100% provides the percentage of incorrect responses.

Applicants respectfully disagree, noting that one of ordinary skill would produce an inaccurate assessment result if they were to do this. Such a procedure as suggested by the Examiner provides the percentage of responses that were not correct, only some of which count as *actual incorrect responses or errors*. However, there are also cases where the subject fails to

respond (non-responses), there are outlier responses, and trials on which stimuli were not correctly presented. Further, in measuring correct responses, one measures something very different in nature than is the case when one measures errors; the former provides information about successful processing while the latter provides an insight into what happens when processing actually fails.

For these and other reasons discussed herein, it is therefore submitted that the presently claimed subject matter of claim 5 is patentably non-obvious. Further, it is submitted that claim 5 is patentable at least by reason of its dependency on a patentable base claim, wherein the claimed subject matter can be readily distinguished from the prior art by virtue of the inclusion of a mask that comprises an image having at least one filled circle.

In item 5, the PTO rejects claims 8 and 25 under 35 U.S.C. § 103 as being unpatentable over Teicher et al., Roenker and Jiang et al as applied to claims 1 and 22 and further in view of Harrison et al. (U.S. Patent No. 6,317,128). The PTO concedes that the combination of Teicher et al., Roenker and Jiang et al. fail to explicitly disclose a response rate curve, but asserts that Harrison et al. remedy this deficiency, citing Figure 12 of Harrison in support.

These rejections are traversed for reasons given herein and previously made of record, including applicants' response submitted on June 19, 2009 (see, e.g., from page 14 commencing at paragraph C.), reconsideration of which is respectfully requested. Further, it is submitted that claims 8 and 25 are patentable at least by reason of their dependency on patentable base claims, wherein the claimed subject matter can be readily distinguished from the prior art by virtue of the inclusion of a mask that comprises an image having at least one filled circle.

In item 6 the PTO rejects claim 10 under 35 U.S.C. § 103 as being unpatentable over Teicher et al., Roenker and Jiang et al. as applied to claim 1 and further in view of Polat et al. (U.S. Patent No. 6,876,758). The PTO concedes that the combination of Teicher et al., Roenker and Jiang et al. fail to disclose that the reference profile is generated from data that are selected from the group consisting of data obtained from a reference group comprising cognitively normal individuals and data previously generated by the user. However, the PTO asserts that Polat et al. remedy this deficiency, citing column 9 lines 22-30 in support.

These rejections are traversed for reasons given herein and previously made of record, including applicants' response submitted on June 19, 2009 (see, e.g., from page 16 commencing at paragraph D.), reconsideration of which is respectfully requested. Further, it is submitted that claim 10 is patentable at least by reason of its dependency on a patentable base claim, wherein the claimed subject matter can be readily distinguished from the prior art by virtue of the inclusion of a mask that comprises an image having at least one filled circle.

In item 7 the PTO rejects claims 1, 2, 3, 9-15 and 17-24 as being unpatentable under 35 U.S.C. § 103 over Polat et al., in view of Roenker in view of Jiang et al. The PTO concedes that Polat et al. fail to disclose masking the test stimulus by placing a mask over or in place of the entire visual test stimulus; presenting a focal point stimulus to the user before presenting the visual test stimulus to the user; the predetermined test stimulus exposure duration is between 10 ms and 300 ms; the mask comprises at least one curved line and a focal point presentation means for presenting a focal point stimulus to the user. The PTO asserts that Roenker corrects these deficiencies, but admits that none of those citations disclose a mask comprised of an image having at least one filled circle. The PTO goes on to assert that Jiang et al. correct this deficiency citing the introduction, 3rd and 4th paragraphs and 2.1 Method in support.

These rejections are traversed for the reasons provided in the foregoing, particularly those provided in detail in the preceding paragraphs supporting traversal of the rejections made in items 1-3 of the Office Action (see, e.g., pages 7 to 11, *supra*). Specifically, it is respectfully submitted that the presently claimed subject matter can be readily distinguished over the prior art by virtue of the inclusion of a mask that comprises an image having at least one filled circle which is not provided in Jiang et al. for the reasons given above.

In item 8 the PTO rejects claims 4, 6 and 7 as being unpatentable under 35 U.S.C. § 103 over Polat et al., in view of Roenker in view of Jiang et al. as applied to claim 1 and further in view of Teicher et al. The PTO concedes that Polat et al., Roenker and Jiang et al. fail to disclose calculating for each stimulus exposure duration an error rate that represents a proportion of responses which are inaccurate; the error rate comprises calculating a mean error; and calculating a mean response time, but contends that Teicher et al. corrects the deficiency.

These rejections are respectfully traversed for reasons given herein and previously made of record, including applicants' response submitted on June 19, 2009 (see, e.g., from page 19 commencing at paragraph B.), reconsideration of which is respectfully requested. Applicants respectfully traverse the additional remarks in the Office Action where it is alleged at page 14, lines 7-11 that "mean error rate" is nothing more than the average error rate based on the number of inputs, and that "the Applicants are stating a mean error rate is calculated for a single test stimulus. One of ordinary skill in the art would be able to determine that there is not any 'mean error rate' for a single input." Applicants respectfully submit that the PTO has misinterpreted applicants' arguments and/or fails properly to interpret claim 7.

Applicants submit that what is claimed includes the step of calculating, for each pre-determined test stimulus exposure duration, a mean response time. This is not the same thing as simply calculating the mean response time for a single stimulus, based on the total number of inputs. What is claimed in the instant application is that a mean response time is calculated for responses provided for each of a plurality of pre-determined test stimulus exposure durations. This is not disclosed or suggested by Teicher et al., who merely determine a single mean error rate calculated over all test stimuli.

Further, it is submitted that claims 4, 6 and 7 are each patentable at least by reason of their dependency on a patentable base claim, wherein the claimed subject matter can be readily distinguished from the prior art by virtue of the inclusion of a mask that comprises an image having at least one filled circle.

In item 9 the PTO rejects claim 5 as being unpatentable under 35 U.S.C. § 103 over Polat et al., Roenker and Jiang et al., as applied to claim 1 and further in view of Hongo et al. The PTO concedes that Polat et al., Roenker and Jiang et al. fail to disclose an error rate curve, but alleges that this deficiency is corrected by Hongo et al.

These rejections are respectfully traversed for reasons given herein and as discussed above in relation to Office Action item 4 and as previously made of record, including applicants' response submitted on June 19, 2009 (see, e.g., from page 20 commencing at paragraph C.), reconsideration of which is respectfully requested. Further, it is respectfully submitted that the presently claimed subject matter of claim 5 can be readily distinguished over

the prior art by virtue of the inclusion of a mask that comprises an image having at least one filled circle.

In item 10, the PTO rejects claim 8 as being unpatentable under 35 U.S.C. § 103 over Polat et al., Roenker, Jiang et al. and Teicher et al. as applied to claim 1 and further in view of Harrison et al. The PTO concedes that Polat et al., Roenker, Jiang et al., and Teicher et al. fail to disclose a response rate curve, but alleges that this deficiency is corrected by Harrison et al., relying on Figure 12 of Harrison et al. in support.

These rejections are respectfully traversed for reasons given herein and previously made of record, including applicants' response submitted on June 19, 2009 (see, e.g., from page 21 commencing at paragraph D.), reconsideration of which is respectfully requested. Further, it is respectfully submitted that the presently claimed subject matter of claim 8 can be readily distinguished over the prior art by virtue of the inclusion of a mask that comprises an image having at least one filled circle.

In item 11 the PTO rejects claim 25 as being unpatentable under 35 U.S.C. § 103 over Polat et al., Roenker, Jiang et al. and Teicher et al. as applied to claim 1, 18 or 20 and further in view of Harrison et al. The PTO concedes that Polat et al., Roenker, Jiang et al., and Teicher et al. fail to disclose a response curve, but alleges that this deficiency is corrected by Harrison et al., citing Figure 12 of Harrison et al. in support.

These rejections are respectfully traversed for reasons given herein and as discussed above in relation to claim 8 and for reasons previously made of record, including Applicant's response submitted on June 19, 2009 (see, e.g., from page 21 commencing at paragraph E.), reconsideration of which is respectfully requested. Further, it is respectfully submitted that the presently claimed subject matter of claim 25 can be readily distinguished over the prior art by virtue of the inclusion of a mask that comprises an image having at least one filled circle.

In view of the foregoing, it is respectfully submitted that the application satisfies all requirements for patentability, including the requirements of 35 U.S.C. § 103. Reconsideration and withdrawal of the rejections are therefore requested.

The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

All of the claims remaining in the application are now clearly allowable. Favorable consideration and a Notice of Allowance are earnestly solicited.

Respectfully submitted,
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